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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,341	01/28/2002	Tatsushi Yamamoto	70868/56922	6144

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 07/15/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/058,341

Applicant(s)

YAMAMOTO ET AL.

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 20 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on June 20, 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has added the limitation that the predetermined portions include "at least a periphery of the backing plate", but there does not appear to be support in the specification as originally filed. As such, the matter is considered to be new and must be canceled.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,199,259 B1 to Demaray et al. (Demaray) in view of US 6,143,149 to Abe.

6. For claim 1, Applicant requires a backing plate that is used for a sputtering apparatus and to which a target is bonded. The backing plate comprises cooling means for feeding a cooling medium to the backing plate at a predetermined flow rate with at least one cooling medium flow passage that includes at least one branch. There is substantially uniform temperature distribution in the target by virtue of controlling the flow rate, feeding the cooling medium to predetermined portions, and applying different sputtering powers to predetermined portions of the target wherein the substantially uniform temperature distribution in the target results in formation of a thin film having a substantially uniform film thickness.

7. Demaray discloses a sputtering target backing plate bonded to a target (abstract) that comprises cooling means (abstract). The cooling means ensure a uniform temperature across the target surface because otherwise, there might be melting (col. 1, l. 51-57). The cooling means flow to predetermined portions of the backing plate at a predetermined rate (col. 1, l. 51-57). As can be seen from Figure 13, the coolant passages have several branches.

8. Demaray does not disclose applying different sputtering powers to predetermined portions of the target.

9. Abe discloses a sputtering process comprising providing a sputtering target with segments (12a – 12d). Each of the segments has a separate power supply (col. 3, l. 21 – col. 4, l. 19). The benefit of using separate power supplies is that it allows for better control of the properties of the sputtered film (col. 4, l. 3-19).

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10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Demaray to use separate power supplies for different target regions because of the desire to better control film properties.

11. For claim 2, Applicant requires the predetermined portions to include at least a periphery of the backing plate. As can be seen from Figure 13, the coolant passages include the periphery of the backing plate.

12. For claim 3, Applicant requires the backing plate to be formed by electron beam welding. For claim 4, Applicant requires laser beam welding. The welding involves welding a member having a groove as a cooling medium flow passage and a member for covering the grooves. Demaray discloses electron beam or laser beam welding the cover to the passage grooves (abstract).

13. For claim 5, Applicant requires the target to be rectangular plate shaped. Demaray uses a rectangular shaped target (Figure 10).

14. For claim 6, Applicant requires an inlet of the cooling medium flow passage to be provided at a position that corresponds to at least one of the four corners of the target. Demaray shows that the coolant inlet is at a position corresponding to a corner of the backing plate (Figure 2; items 69, 71).

15. For claim 7, Applicant requires a sputtering method for forming a thin film on a substrate comprising: applying different sputtering powers to portions of the target; and cooling the target via a cooling means that includes at least one cooling medium flow passage for feeding a cooling medium to the backing plate at a predetermined flow rate and includes at least one branch to ensure uniform temperature distribution and uniform film thickness.

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16. When Abe modifies Demaray, the limitations of claim 7 are also met.
17. Claims 1, 2, 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,143,149 to Abe in view of US 5,985,115 to Hartsough et al. (Hartsough).
18. Claims 1, 2, and 7 are described above.
19. Abe discloses a sputtering process comprising providing a sputtering target with segments (12a – 12d). Each of the segments has a separate power supply (col. 3, l. 21 – col. 4, l. 19).
20. Abe does not disclose cooling the target to ensure uniform temperature distribution.
21. Hartsough discloses that sputtering targets need to have their heat dissipated so that the target will not be damaged (col. 2, l. 4-12). Hartsough uses a backing plate with turbulent flow to achieve uniform target cooling (abstract).
22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Abe to use the backing plate of Hartsough because of the desire to dissipate the heat of the target, which could damage the sputtering target. The apparatus would have all of the features of claims 1 and 2.

***Response to Amendment***

23. The objection to the drawings presented in the office action mailed March 20, 2003 is withdrawn in light of the proposed drawing correction.
24. The objection to the specification presented in the office action mailed March 20, 2003 is withdrawn in light of the amendment.
25. The 112-second paragraph rejection presented in the office action mailed March 20, 2003 is withdrawn in light of the amendment.

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26. The 102(e) rejection of claims 1-6 over Demaray presented in the office action mailed March 20, 2003 is withdrawn in light of the amendment to include the requirement to claim 1 that separate power supplies are supplied to the target.

27. The 103(a) rejection of claim 7 of Abe in view of Hartsough presented in the office action mailed March 20, 2003 stands.

### ***Response to Arguments***

28. Applicant's arguments filed June 20, 2003 have been fully considered but they are not persuasive.

29. Applicant has argued that Demaray is not designed to allow control of the conductance to be achieved. Applicant has not claimed such a limitation.

30. Applicant then argues that Abe teaches away from the instant invention in that Abe discloses the ability to control sputtering so that films of different thickness may be achieved. Abe certainly does teach that limitation, but Abe is also directed to forming uniform thickness films (col. 4, l. 4-19). Therefore, Abe does not explicitly teach away from the claimed invention. Abe merely discloses the ability to control sputtering so that uniform or non-uniform films may be fabricated as desired.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (703) 308-0661.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Palestine Jenkins at (703) 308-3521.

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For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (703) 308-0661.

*Conclusion*

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

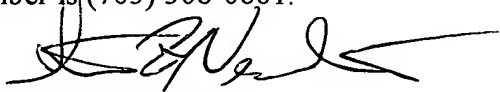
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

A handwritten signature in black ink, appearing to read 'S. VerSteeg', with a long horizontal stroke extending to the right.

Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
July 14, 2003